

Listing of the Claim:

Please cancel, without prejudice, claim 1. New claims 64-84 have been added.

Listing of the Claim:

Claims 1-63 have been cancelled.

64.(New) A method of sensing the data content of a non-volatile memory, comprising:

 biasing a multi-state storage element of the non-volatile memory according to a set of operating parameters and target criteria;

 determining to a first resolution the value of a parameter indicative of the state of said storage element a plurality of times with the storage element biased according to said set of operating parameters and target criteria;

 individually storing said plurality of parameter values determined to the first resolution; and

 determining the multi-state data content of said storage element to a second resolution less than said first resolution by forming a composite of said plurality of values of said parameter individually stored at the first resolution.

65.(New) A method according to Claim 64, wherein the storage element is a charge storing device.

66.(New) A method according to Claim 65, wherein the step of determining the value of a parameter is performed to yield a digital value.

67.(New) A method according to Claim 65, wherein the parameter is one of a current; a voltage; a time; a frequency; a magnetic property; and an optical property.

68.(New) A method according to Claim 65, wherein the forming a composite comprises one of the following:

 adding the plurality of parameter values to form a sum; and dividing the sum by the number of parameter values added;

forming a mean of the plurality of parameter values; forming a weighted mean of the plurality of parameter values;

a peak detection scheme; and

omitting outlying values of the plurality of parameter values.

69.(New) A method according to Claim 68, wherein the forming a composite comprises adding the plurality of parameter values to form a sum; and dividing the sum by the number of parameter values added.

70.(New) A method according to Claim 65, wherein the non-volatile memory comprises a memory unit containing a plurality of storage elements including said storage element and a controller, and wherein the composite is formed by the controller.

71.(New) A method according to Claim 70, wherein the values of the parameter indicative of the state of the storage element are individually stored on one of the controller or the memory prior to the forming a composite.

72.(New) A method according to Claim 64, wherein said storage element is one of a plurality of storage elements read concurrently.

73.(New) A method according to Claim 64, wherein the non-volatile memory comprises a memory unit containing a plurality of storage elements including said storage element and a controller, and wherein the values of the parameter indicative of the state of said storage element are individually stored on the memory unit prior to the forming a composite and wherein the composite is formed by the memory unit.

74.(New) A method according to Claim 64 performed as part of the verify phase of a programming operation.

75.(New) A method according to Claim 64, wherein the determining the value of a parameter indicative of the state of the storage element comprises:

determining a base value for the parameter; and

determining variation from the base value a plurality of times.

76.(New) A non-volatile memory comprising:
an array of multi-state storage elements;
read circuitry coupled to the array to provide a parameter associated with the state of a cell contained therein;
a sense amplifier coupled to the read circuitry to determine the value of the parameter to a first resolution; and
averaging circuitry coupled to the sense amplifier for individually storing multiple independently determined values of the parameter supplied from the sense amplifier at the first resolution and forming a composite multi-state data value of a second resolution less than the first resolution for the single cell formed from said multiple independently determined values of the parameter supplied from the sense amplifier at the first resolution .

77.(New) A memory according to Claim 76, wherein the parameter is one of a current level; a voltage level; a time; a frequency; a magnetic property; and an optical property.

78.(New) A memory according to Claim 76, wherein the averaging circuitry comprises an adder to produce a sum of the multiple independently determined values and a division circuit for dividing the sum by the number of independently determined values added to produce the sum.

79.(New) A memory according to Claim 76, wherein the memory comprises a storage section that includes the array, read circuitry, and sense amplifier and a controller section that includes the averaging circuitry.

80.(New) A memory according to Claim 79, wherein the controller section includes a plurality of registers wherein the multiple independently determined values of the parameter supplied from the sense amplifier are stored prior to being supplied to the averaging circuitry.

81.(New) A memory according to Claim 76, wherein the memory comprises a controller section and a storage section, the storage section including the array, read circuitry, sense amplifier and the averaging circuitry.

82.(New) A memory according to Claim 81, wherein the controller section includes a plurality of registers wherein the multiple independently determined values of the parameter supplied from the sense amplifier are stored prior to being supplied to the averaging circuitry.

83.(New) A memory according to Claim 76 including programming circuitry coupled to the array for changing the state of the storage elements contained therein and coupled to the averaging circuitry for receiving the composite value, wherein the composite value is used during the verify phase of a programming process.

84.(New) A non-volatile memory-comprising an array of storage elements, biasing circuitry whereby selected storage elements can be biased, and read circuitry to provide the data content of the selected elements when biased by the biasing circuitry, wherein the read circuitry senses the selected storage elements in a first mode, wherein the selected storage elements are sensed once for each of one or more first sets of bias conditions, subsequently senses the selected storage elements in a second mode, wherein the selected storage elements are sensed a plurality of times for each of one or more second sets of bias conditions which differ from the first sets of bias conditions, and determines the data content of the selected storage elements from a combination of the sensing in the first mode and the sensing in the second mode.